

Trend Study 17-53-05

Study site name: Two Bar Ranch.

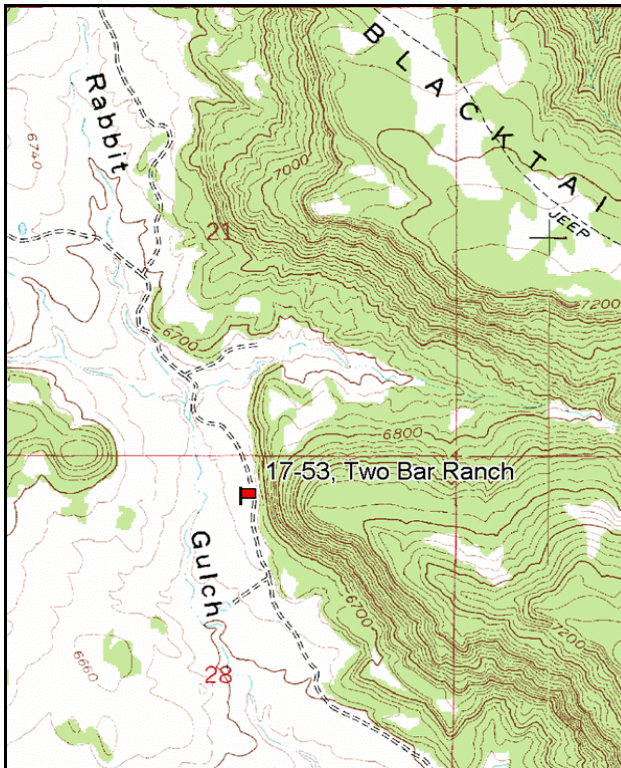
Vegetation type: Wyoming Big Sagebrush.

Compass bearing: frequency baseline 345 degrees magnetic.

Frequency belt placement: line 1 (9 & 85ft), line 2 (26ft), line 3 (45ft), line 4 (60ft).

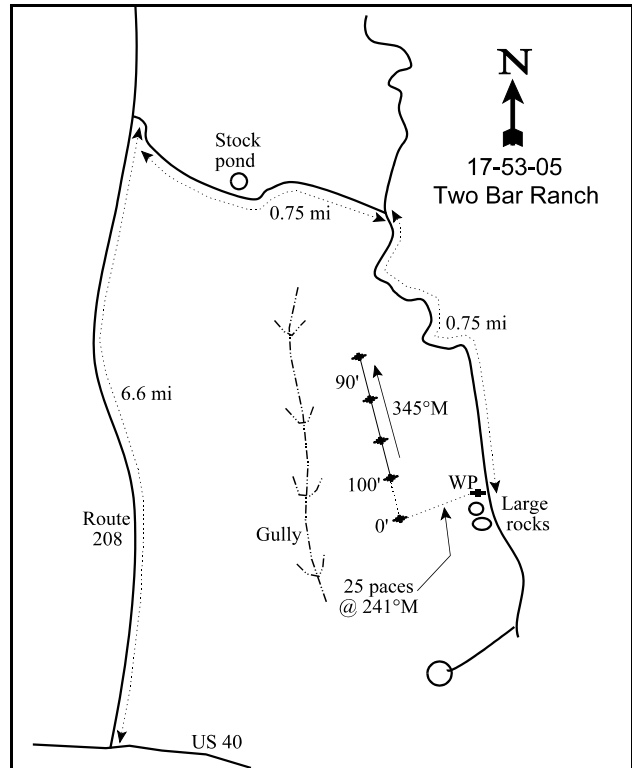
LOCATION DESCRIPTION

From U.S. 40 five miles east of Fruitland, take Rt. 208 north towards Tabiona for 6.6 miles. Just after a small road cut, there is a road on the right. Turn right towards Rabbit Gulch and go 0.75 miles to an intersection. Turn right (south) and go another 0.75 miles down a gully-ridden road to two large rocks on the west side of the road. From the highest point of the first rock, the 0-foot baseline stake is 25 paces away bearing 241°M. The baseline runs to the north.



Map Name: Tabiona

Township 2S, Range 7W, Section 28



Diagrammatic Sketch

GPS: NAD 27, UTM 12T 4459012 N, 527287 E

DISCUSSION

Two Bar Ranch - Trend Study No. 17-53

The Two Bar Ranch study is located on the upper part of Rabbit Gulch near the base of Blacktail Ridge. The study is within a large sagebrush flat with a gentle 5% slope and an aspect to the west. The elevation is approximately 6,600 feet. This is the lowest elevation for a trend study on the unit. Thermal and escape cover for big game is limited within the sagebrush flat, but good cover is available in the pinyon-juniper woodland along the ridge east of the site. This entire area is considered critical deer winter range. There is evidence of substantial deer use during past readings. Pellet group quadrat frequency data from 1995 indicated moderate numbers of deer and elk use this area. In 2000, pellet group data were estimated at 38 deer and 35 elk days use/acre (94 ddu/ha and 86 edu/ha). Pellet group data in 2005 estimates were 23 deer, 17 elk, and 1 cow days use/acre (56 ddu/ha, 43 edu/ha, and 2 cdu/ha).

Soils are alluvially deposited, moderately deep, and somewhat sandy in texture. The effective rooting depth is estimated at just over 15 inches with deeper measurements limited only by soil compaction. There is little rock on the soil surface or within the profile. Soil texture is a sandy clay loam with a slightly alkaline soil reaction (pH of 7.7). Phosphorus was measured at 1.5 ppm and values less than 6 ppm may limit normal plant growth and development in wildland soils (Tiedemann and Lopez 2004). Exposed bare ground was extensive and erosion was occurring at an accelerated rate in 1982, as evidenced by many small rills and gullies. Vegetation was sparse and generally inadequate to prevent soil movement. Conditions have improved slightly since 1982, but they are still only poor to fair and erosion is still a problem. The erosion index measurement in 2005 rated the soil erosion as high to moderate, mainly because of small frequent pedestals surrounding shrubs and perennial grasses, gullies covering over 50% of the site (two large gullies on the site), large amounts of soil movement, minor litter movement, many small rills, and moderate flow patterns between perennial species.

The key browse species is Wyoming big sagebrush, with shadscale present but historically of secondary importance. Density of sagebrush has fluctuated considerably since 1982 from 2,533 sagebrush plants/acre to 9,865 plants/acre in 1988 (a change mainly in young and decadent plant numbers), 5,080 plants/acre in 1995, 5,080 plants/acre in 2000, and 2,280 plants/acre in 2005. The population has had a strong population of mature individuals around 2,000 to 3,000 plants/acre, until 2005. The percent decadence was low (below 15%) until 2000 when it increased to 33% and then to 62% in 2005. The plants classified as dying also increased from 7% in 1995 to 14% in 2000, then to 55% by 2005. The percentage of young individuals was as high as 66% in 1988, then decreased to 26% in 1995, then 11% in 2000, and then 3% in 2005. This decrease in young and drastic increase in percent dying has led to the substantial decrease in population.

Shadscale were historically moderately abundant and provided 22% of the browse cover with a density of 4,020 plants/acre in 2000 and less in previous years. In 2005, the shadscale increased in percent cover to produce more cover and density than sagebrush (2,640 plants/acre of shadscale compared to 2,280 plants/acre of sagebrush). Although shadscale declined in population as sagebrush did, shadscale declined slightly less. Shadscale also increased in percent decadence and percent dying. In 1995, decadent shadscale plants only made up 1% of the population, but increased to 12% in 2000, and 10% in 2005. Percent dying increased from 1% of the population in 1995 to 2% in 2000, to 6% in 2005. The percentage of shadscale with poor vigor mirrored the pattern of percent dying with the only exception was that 9% of the population showed poor vigor in 2005. Use has been mostly light.

The herbaceous understory is deficient. Four perennial grass species, thickspike wheatgrass, Indian ricegrass, squirreltail, and needle-and-thread make up the bulk of the herbaceous cover. Thickspike wheatgrass decreased significantly in nested frequency in 2005. Perennial forbs are scarce with hoary aster, longleaf phlox, and scarlet globemallow combining to produce most of the meager forb cover. Cover of forb was just over 1% in 1995 and just over one-half of 1% in 2000, but increased to nearly 7% in 2005. This increase was due to a large increase in scarlet globemallow and annual stickseed.

1982 APPARENT TREND ASSESSMENT

Currently, this area is rather poor quality winter range. Significant improvements are possible but will be difficult to achieve. Soil trend appears to be declining and must be reversed if any vegetation change is to occur. The area appears stable but at a low level of plant species diversity. A principle management goal should be to improve species diversity among all classes of vegetation.

1988 TREND ASSESSMENT

There appears to have been a decrease in vegetation basal cover and litter cover. Although there was an increase in cryptogamic cover from 3 to 12%, there was an overall decrease in total protective ground cover in 1988 resulting in a large amount of bare soil (53%). Small gullies have expanded since the 1982 study, with accelerated soil loss continuing. Soil trend is slightly down. Although the total number of sagebrush has increased by two and one-half times on the density plots, the density of mature plants and mean sagebrush occurrence are unchanged. There is a moderately dense stand of mature sagebrush (2,066 plants/acre) and consistent cover of 8%. More decadent plants, but also many more young plants, were found in 1988. The degree of hedging has increased since 1982. Hedging on 48% of the available sagebrush is moderate, whereas most (87%) were rated as lightly hedged in 1982. Trend appears up due to the large numbers of seedlings and young plants and a stable mature population. Trend for the herbaceous understory is stable but in poor condition. Quadrat frequency of grasses increased slightly while frequency of forbs declined.

TREND ASSESSMENT

soil - slightly down (-1)

browse - up (+2)

herbaceous understory - stable (0)

1995 TREND ASSESSMENT

Soil conditions have improved but are still poor. Percent bare ground declined from 53% in 1988 to 34%. Litter cover remained similar and cryptogamic cover increased to 16%. In addition, sum of nested frequency for grasses increased providing improved soil protection. Trend for soil is slightly up but still only in fair condition. The browse trend is stable. Past data suggest wide fluctuations in Wyoming big sagebrush density. However, percent decadency has remained similar to 1988 estimates (13% vs 14%) and there are adequate numbers of seedlings and young plants to maintain the population. The proportion of plants displaying heavy use has increased from 3% to 35%. This could cause an increase in decadence in the future as heavy use increases or if use is consistently high for several years. Trend for the herbaceous understory is up for grasses and forbs, but still slightly deficient. The Desirable Components Index rated this site as good with a score of 61 due to moderate browse cover, low decadency, and good perennial grass and forb cover.

TREND ASSESSMENT

soil - slightly up (+1)

browse - stable (0)

herbaceous understory - up (+2)

winter range condition (DC Index) - good (61) Lower Potential scale

2000 TREND ASSESSMENT

Trend for soil is considered stable. The slightly downward changes are not enough to warrant a change in trend. Relative percent cover of bare ground has increased slightly, while litter cover has declined slightly. In addition, the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground has decreased slightly. There is still erosion occurring in the area with several active gullies around the site. Trend for the key browse species, Wyoming big sagebrush, appears stable. Density is identical to 1995 estimates and use is also similar. Drought is obviously effecting the health of the sagebrush. The proportion of sagebrush displaying poor vigor has increased from 7% in 1995 to 16% in 2000. Decadence has also increased from 15% to 33%. In addition, 43% (720 plants/acre) of the decadent shrubs appear to be dying. Seedling and young recruitment is good and appears sufficient to maintain the population at this time. A return to normal precipitation patterns will do much to improve sagebrush health. Trend for the herbaceous understory is stable for grasses and down slightly for forbs. Forbs are still very limited and currently produce less than 1% cover. Since grasses provide the majority of the herbaceous cover (about 95%), the overall herbaceous trend is stable. The Desirable Components Index rated this site as good with a score of 60 due to moderate browse cover, high decadency, and good perennial grass and forb cover.

TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - stable (0)

winter range condition (DC Index) - good (60) Lower Potential scale

2005 TREND ASSESSMENT

The trend for soil is stable. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground changed little from 2000 to 2005, although the site shows many signs of moderate active erosion. The trend for browse is down. The two key browse species on the site, Wyoming big sagebrush and shadscale, both declined in population from 2000 to 2005. The sagebrush population decreased 55% with major losses in numbers of young and mature individuals. Percent decadence nearly doubled from 33% in 2000 to 62% in 2005. The individuals classified as dying increased from 14% of the population in 2000 to 55% in 2005, with a decrease in the percentage of young individuals from 11% to 3%. The shadscale population decreased 34% from 4,020 plants/acre in 2000 to 2,640 plants/acre in 2005. The percent decadence decreased very slightly and the percent dying increased slightly. The herbaceous understory trend is down. The nested frequency of perennial grasses decreased by 23%, while perennial forbs increased over 100%. The percent cover of perennial grasses increased from 10% to 12% and perennial forbs increased from less than 1% to 3%. However, on average perennial forbs only contributed to only about 14% of the herbaceous cover. The perennial forb increase was due to the significant increase in globemallow, which has little forage value in winter, and therefore does not stabilize the trend. The Desirable Components Index rated this site as good with a score of 56 due to moderate browse cover, high decadency, and good perennial grass and forb cover.

TREND ASSESSMENT

soil - stable (0)

browse - down (-2)

herbaceous understory - down (-2)

winter range condition (DC Index) - good (56) Lower Potential scale

HERBACEOUS TRENDS --

Management unit 17 , Study no: 53

Type	Species	Nested Frequency				Average Cover %		
		'88	'95	'00	'05	'95	'00	'05
G	Agropyron dasystachyum	_b 132	_c 173	_{bc} 156	_a 62	2.55	3.42	1.81
G	Bromus tectorum (a)	-	1	-	-	.00	-	-
G	Carex sp.	_c 73	_{ab} 38	_a 15	_{bc} 43	.23	.18	.46
G	Oryzopsis hymenoides	40	65	31	39	1.10	.87	1.62
G	Sitanion hystrix	29	29	49	23	1.33	1.10	1.16
G	Sporobolus cryptandrus	-	2	-	-	.00	-	-
G	Stipa comata	_a 29	_a 51	_b 103	_b 106	1.82	4.39	6.96
Total for Annual Grasses		0	1	0	0	0.00	0	0
Total for Perennial Grasses		303	358	354	273	7.06	9.97	12.02
Total for Grasses		303	359	354	273	7.07	9.97	12.02
F	Arabis sp.	-	7	3	5	.04	.00	.01
F	Astragalus convallarius	-	-	-	4	-	-	.01
F	Chenopodium fremontii (a)	-	3	-	6	.01	-	.01
F	Chenopodium leptophyllum(a)	-	_b 6	_a -	_b 18	.02	-	.05
F	Collinsia parviflora (a)	-	-	-	1	-	-	.00
F	Descurainia pinnata (a)	-	_a 1	_a 1	_b 49	.00	.00	.60
F	Draba sp. (a)	-	3	-	-	.00	-	-
F	Eriogonum cernuum (a)	-	2	-	8	.01	-	.02
F	Lappula occidentalis (a)	-	_b 16	_a -	_c 112	.03	-	2.67
F	Lepidium sp. (a)	-	_b 24	_a -	_a 5	.12	-	.04
F	Lychnis drummondii	1	-	-	-	-	-	-
F	Machaeranthera canescens	_a 6	_b 32	_a 1	_a 4	.22	.03	.06
F	Phlox longifolia	_a 3	_c 81	_a 7	_b 43	.21	.06	.28
F	Plantago patagonica (a)	-	_{ab} 9	_a -	_b 18	.07	-	.06
F	Schoenocrambe linifolia	_a 2	_b 10	_a 1	_a 3	.03	.03	.00
F	Sphaeralcea coccinea	_a 52	_a 65	_a 62	_b 103	.45	.50	2.71
F	Townsendia incana	-	1	-	2	.03	-	.03
Total for Annual Forbs		0	64	1	217	0.28	0.00	3.46
Total for Perennial Forbs		64	196	74	164	0.99	0.62	3.12
Total for Forbs		64	260	75	381	1.28	0.63	6.59

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Management unit 17 , Study no: 53

Type	Species	Strip Frequency			Average Cover %		
		'95	'00	'05	'95	'00	'05
B	Artemisia tridentata wyomingensis	93	82	57	11.23	13.25	4.33
B	Atriplex confertifolia	63	70	62	2.59	4.47	6.48
B	Ceratoides lanata	0	2	1	-	-	.00
B	Chrysothamnus depressus	0	0	0	-	-	.03
B	Chrysothamnus viscidiflorus viscidiflorus	1	1	2	-	-	.00
B	Opuntia sp.	36	39	37	1.10	.97	1.02
B	Pediocactus simpsonii	0	0	1	-	-	.00
B	Pinus edulis	0	4	3	.15	.38	.38
B	Sarcobatus vermiculatus	16	14	17	1.28	1.25	3.28
B	Tetradymia spinosa	0	0	1	.00	-	-
Total for Browse		209	212	181	16.36	20.32	15.55

CANOPY COVER, LINE INTERCEPT --

Management unit 17 , Study no: 53

Species	Percent Cover
	'05
Artemisia tridentata wyomingensis	4.13
Atriplex confertifolia	7.80
Ceratoides lanata	.13
Juniperus osteosperma	.50
Opuntia sp.	.93
Sarcobatus vermiculatus	4.09

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 17 , Study no: 53

Species	Average leader growth (in)
	'05
Artemisia tridentata wyomingensis	2.9

BASIC COVER --

Management unit 17 , Study no: 53

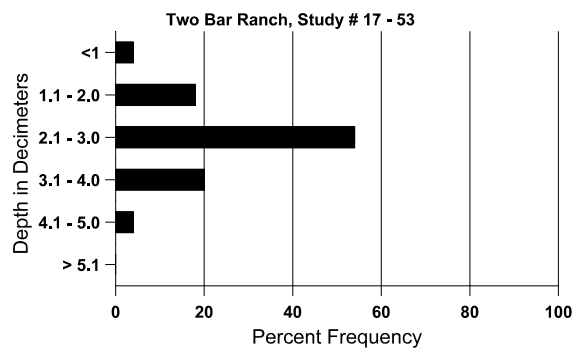
Cover Type	Average Cover %				
	'82	'88	'95	'00	'05
Vegetation	5.50	2.00	26.45	30.25	28.32
Rock	0	1.00	.06	.15	.01
Pavement	0	.50	.12	.09	.07
Litter	45.25	31.50	29.09	27.65	34.43
Cryptogams	2.50	12.25	15.82	15.10	11.37
Bare Ground	46.75	52.75	33.79	45.52	43.01

SOIL ANALYSIS DATA --

Herd Unit 17, Study # 53, Study Name: Two Bar Ranch

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
15.4	62.8 (16.1)	7.7	52.6	24.8	22.6	1.2	1.5	92.8	0.5

Stoniness Index



PELLET GROUP DATA --

Management unit 17 , Study no: 53

Type	Quadrat Frequency		
	'95	'00	'05
Rabbit	2	3	18
Elk	17	11	18
Deer	28	9	28
Cattle	-	-	-

Days use per acre (ha)	
'00	'05
-	-
35 (86)	17 (43)
38 (93)	23 (57)
-	1 (2)

BROWSE CHARACTERISTICS --
Management unit 17 , Study no: 53

		Age class distribution (plants per acre)					Utilization					
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia nova</i>												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	11/23
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Artemisia tridentata wyomingensis</i>												
82	2533	2000	333	2000	200	-	13	0	8	-	0	25/29
88	9865	1866	6466	2066	1333	-	39	3	14	-	.67	22/21
95	5080	340	1300	3020	760	1320	48	35	15	7	7	21/30
00	5080	180	560	2840	1680	1240	40	28	33	14	16	17/25
05	2280	20	60	800	1420	3280	25	52	62	55	56	17/23
<i>Atriplex confertifolia</i>												
82	2599	1133	1266	1333	-	-	18	0	0	-	0	12/20
88	3399	333	1000	1866	533	-	12	2	16	-	0	10/10
95	3080	-	620	2420	40	-	7	3	1	1	1	12/19
00	4020	60	500	3040	480	-	8	12	12	2	2	8/15
05	2640	680	240	2140	260	160	2	0	10	6	9	14/22
<i>Ceratoides lanata</i>												
82	0	-	-	-	-	-	0	0	0	-	0	-/-
88	0	-	-	-	-	-	0	0	0	-	0	-/-
95	0	-	-	-	-	-	0	0	0	-	0	6/7
00	40	-	20	-	20	-	0	0	50	50	50	-/-
05	20	-	-	20	-	-	100	0	0	-	0	13/14
<i>Chrysothamnus viscidiflorus viscidiflorus</i>												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	20	-	-	20	-	-	0	0	-	-	0	10/4
00	20	-	-	20	-	-	0	0	-	-	0	9/18
05	40	140	20	20	-	-	0	0	-	-	0	14/23

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Opuntia sp.												
82	0	-	-	-	-	-	0	0	0	-	0	-/-
88	2066	-	133	1933	-	-	0	0	0	-	0	4/3
95	1260	-	20	1080	160	80	0	0	13	6	8	5/15
00	1440	-	80	1300	60	60	0	0	4	4	8	4/9
05	1380	-	60	1220	100	160	0	0	7	1	1	5/15
Pediocactus simpsonii												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	20	-	-	20	-	-	0	0	-	-	0	0/1
Pinus edulis												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
88	66	-	66	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	80	-	60	20	-	-	0	0	-	-	0	-/-
05	60	-	40	20	-	-	0	33	-	-	0	-/-
Sarcobatus vermiculatus												
82	0	-	-	-	-	-	0	0	0	-	0	-/-
88	1399	-	733	533	133	-	0	0	10	-	0	39/27
95	700	20	380	320	-	-	0	0	0	-	0	47/38
00	500	-	40	460	-	-	0	0	0	-	0	29/37
05	560	-	160	340	60	20	0	0	11	-	0	28/43
Tetradymia canescens												
82	0	-	-	-	-	-	0	0	-	-	0	-/-
88	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	20	-	-	20	-	-	0	0	-	-	0	7/11